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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,771	01/08/2002	Matthew Boyd	7373/72556	6313

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EXAMINER

FISCHER, JUSTIN R

ART UNIT PAPER NUMBER

1733

DATE MAILED: 11/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/038,771

Applicant(s)

BOYD ET AL.

Examiner

Justin R Fischer

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-20, 22-29, 31-41 and 44-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-20, 22-29, 31-41 and 44-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>101304</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 13, 2004 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5, 7-10, 12-15, 17, 20, 22, 25, 31-34, 38, 39, and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Hall (US 5,579,998, of record). Hall is applied in the same manner as set forth in the previous office action (Paragraph 6).

As best depicted in Figures 1 and 2, Hall teaches a method of coating a support surface or substrate comprising the steps of providing reinforcing material, providing binder or liquid resin, mixing said reinforcing material and said binder so as to fully wet the reinforcing material, applying a stream of the mixture to said substrate, and curing or solidifying the coated substrate (Column 2, Lines 27-38 and Column 6, Line 59 -

Column 7, Line 4, Column 7, Lines 25-33). In this instance, the coated substrate, after curing, is being viewed as the preform.

Regarding the term "preform" (as set forth in the Advisory Action), applicant has attached the following definition: intended to cover any structure used as a reinforcing insert or structural support within a composite structural part, which is preferably, but not necessarily, a molded part. In this instance, applicant has attempted to define a "preform" in terms of its intended use, that being as an insert or support in a composite structural part. Clearly, the structure of Hall (substrate having layer of fibers/binder thereon) can be viewed as constituting a "preform" in that it is capable of being included within a composite structural part. For example, Hall suggests a possible use of the coated substrate as an ablative coating in the aerospace industry (e.g. rocket motor casing)- the coated substrate is included within a rocket or composite structural part. In view of the above noted definition, the term "preform" does not require any further processing or shaping. It is agreed that the coated substrate of Hall is not further processed, for example by molding; however, the term "preform", in view of applicant's original disclosure, only requires a substrate having a fiber/resin matrix thereon and capable of being used as an insert or support within a composite structural part.

Regarding claims 2, 3, 32, and 33, the method of Hall fails to include forced air at the surface of the substrate or a plenum system. The gaseous stream that carries the reinforcing material is not seen to constitute "forced air at the support surface".

With respect to claim 4, as depicted in Figures 1 and 2, the mixture is sprayed against the support surface or substrate.

As to claims 5, 7, and 31, Hall suggests the use of fibrous material (analogous to chopped fibers) as the reinforcing material (Column 1, Lines 15-20).

Regarding claim 8, the resin or binder material is transferred through cylinder 12 and emitted as a stream through nozzle 1.

With respect to claims 9, 10, 13, 14, and 34, Hall suggests that the resin or binder can be heated (i.e. conditioned) while in the resin supply or during the transporting step to the substrate, both of which are prior to mixing with the reinforcing material.

Regarding claim 12, both the reinforcing material and the binder (plurality of streams) are supplied as a stream to a region adjacent the nozzle 1, at which time the components are mixed and disposed against the substrate.

As to claims 15 and 17, Hall suggests the following heating techniques: while said binder is in supply holding means, during circulation through lines, or in the cylinder itself (Column 6, Lines 39-45). Thus, the binder and reinforcing material are mixed while heat is applied if the binder is heated while it is in the cylinder (mixing of components occurs at end of cylinder).

With respect to claims 20, 22, 38, 39, and 41, as depicted in Figures 1 and 2, the binder/reinforcing material mixture is applied to a "vertical support surface" or substrate at ambient air conditions. The term "substrate" in Hall is seen to comprise a "solid support surface".

As to claim 25, after the fibers and binder are deposited on the support surface, the assembly is cured in a conventional manner. It is clearly evident that after curing,

the assembly is exposed to ambient conditions, which is seen to constitute a "cooling" step. It does not appear that applicant intends such language to require the preform be placed within a cooling chamber or similar cooling zone/region.

Regarding claim 31, the reinforcing material of Hall can be fibrous (Column 1, Lines 15-20). Also, Hall broadly suggests the use of a substrate, which is seen to include the formation of "structural parts", especially in view of a suggested use in aerospace hardware (Column 8, Lines 45-48).

4. Claims 1-8, 12, 20, 22, 23, 25-29, and 44-46 are rejected under 35 U.S.C. 102(b) as being anticipated by Hedman (GB 2,015,915, newly cited). Hedman (Abstract) discloses a method of forming a preform comprising the steps of providing chopped fiberglass, providing binder material, mixing said fiber glass and said binder and applying a stream of the mixture to a support surface or former 14, and solidifying the mixture (preform is described as "bonded preform"). In describing the support surface, Hedman states that it can be a perforated sheet, which is seen to constitute a solid support surface in view of applicant's disclosure (particularly the dependency of claim 23, which further limits the structure of a "solid support surface" by requiring apertures in the surface, on claim 1).

As to claims 2, 3, 5, and 46, the method of Hedman does not include forced air, a plenum system, or a vacuum. It is noted that while Hedman mentions the use of a suction fan, the reference clearly envisions embodiments in which no fan is required (reference suggests that a fan may be used "in certain applications").

Regarding claims 12 and 45, both the reinforcing material and the binder (plurality of streams) are supplied as a stream to a region adjacent the support surface, at which time the components are mixed and disposed against said support surface.

As to claim 20, the method of Hedman is applicable with vertical surfaces (Page 2, Lines 35-45)- it is emphasized that the method does not require the use of a suction fan as it is described as being used "in certain applications".

With respect to claim 22, ambient conditions exist at the deposition region of the support surface.

As to claim 25, after the fibers and binder are deposited on the support surface, the assembly is cured. It is clearly evident that after curing, the assembly is exposed to ambient conditions, which is seen to constitute a "cooling" step. It does not appear that applicant intends such language to require the preform be placed within a cooling chamber or similar cooling zone/region.

As to claims 26, 28, 29, and 44, the method of Hedman comprises placing said preform in a mold, injecting resin (moldable material) into said mold, and curing the assembly. (Page 2, Lines 70-80).

Regarding claim 27, Hedman discloses the potential use of a vacuum.

With respect to claim 40, as noted above, the support surface of Hedman can be a perforated sheet and the use of a suction fan is only described "in certain applications".

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall and further in view of Sorathia (US 5,320,870, of record). As noted in the previous paragraph, Hall discloses a method of coating a substrate and subsequently curing it to form a preform in which a stream of reinforcing material and a stream of resin/binder are combined and applied to a support surface. Hall suggests that the coated substrate can be used as thermal insulation or as an ablative coating in aerospace hardware (Column 8, Lines 45-48). In describing conventional coating techniques, Hall suggests that the reinforcing material is commonly fibers, glass microspheres, and the like (Column 1, Lines 15-20). A fair reading of the disclosure suggests that these reinforcing materials are applicable to the coating method and apparatus of Hall- while Hall might describe the use of glass microspheres and cork in more detail (as compared to fibers), the reference expressly suggests the use of fibers as the reinforcing material. However, the reference fails to teach the use of chopped fiberglass. In any event, one of ordinary skill in the art at the time of the invention would have found it obvious to use chopped fiberglass as the specific fibrous reinforcement in Hall since chopped fiberglass is extensively used within a variety of coatings and provides a high degree of reinforcement, as shown for example by Sorathia (Column 2, Lines 27-43). It is further

noted that the chopped fiberglass/resin matrix of Sorathia is described as usable in fire protective coatings in which thermal insulation is desired- as noted above, the fibrous matrix/coating of Hall is described as a thermal insulation. Thus, the prior art of record recognizes the well-known use of chopped fiberglass and particularly, the known use of chopped fiberglass in the manufacturing of coatings useable as thermal insulation.

Therefore, one of ordinary skill in the art at the time of the invention would have had ample motivation to selected chopped fiberglass as the fibrous reinforcing material in the method of Hall. It is emphasized that chopped fiberglass represents an extremely well known and extensively used reinforcing material in the formation of composite materials independent of the specific function of the article being manufactured.

7. Claims 24 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hedman and further in view of Barron. As disclosed above, Hedman substantially teaches the method of the claimed invention, including the deposition/spraying of chopped fiberglass and a binder against a support surface to define a preform and the subsequent placement of said preform in a mold. While Hedman fails to suggest any shaping of the assembly before it is solidified, the technique of "shaping" is well known and extensively used in the manufacture of preforms, as shown for example by Barron (Column 10, Lines 3-10). This technique is used to achieve a desired shape of the preform before it is incorporated into a composite article. It is noted that Barron suggests that the shaping can occur as the preform is made (analogous to that required by the claimed invention) or just prior to arranging the preform in a mold. Absent any conclusive showing of unexpected results, one of ordinary skill in the art at the time of

the invention would have found it obvious to shape the assembly of Hedman prior to solidifying.

8. Claims 16, 18, 19, 31, 35, 36, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hedman and further in view of Barron (US 6,030,575, of record) and optionally in view of Hall. As disclosed above, Hedman substantially teaches the method of the claimed invention, including the deposition/spraying of chopped fiberglass and a binder against a support surface to define a preform and the subsequent placement of said preform in a mold. In this instance, though, Hedman is completely silent as to any pre-heating of the binder. Barron, on the other hand, is similarly directed to the manufacture of a preform and suggests that a pre-heating treatment (of the binder) promotes bonding between the fibers and the binder by partially melting said binder prior to contact with the fibers (Column 6, Lines 30-55). Hall is optionally applied since it provides further evidence that it is well known to heat a binder prior to contact with a fiber reinforcement in the manufacture of a preform (Column 6, Lines 27-50). One of ordinary skill in the art at the time of the invention would have found it obvious to supply the binder stream of Hedman as a "heated" stream for the benefits detailed above absent any conclusive showing of unexpected result.

As to claim 16, it is unclear if the claim positively requires a heating step after the binder and fiber are mixed. It is evident that the mixture is heated (heat is spread through the mixture) over a certain extent due to the conditioning of the binder. This zone is seen to constitute a heat zone.

Regarding claims 18 and 35, the zone in which the fibers and the binder are mixed is seen to constitute a "heat zone" in that the heated binder affects the temperature of said zone. It is further noted that the claim does not appear to require the mixing of a heated binder and a fiber reinforcement in a zone that is further heated (in addition to that applied to the binder).

With respect to claims 19 and 36, Barron suggests that a flame represents a suitable heat source.

Regarding claim 40, as noted above, the perforated sheet of Hedman is seen to constitute a "perforated support surface" and in view of Barron, it would have been obvious to condition or heat the binder prior to contact with the fiber reinforcement.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin R Fischer whose telephone number is (571) 272-1215. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Justin Fischer

November 9, 2004



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